

SECTION 6. SOILS, INVESTIGATIONS, FIELD SURVEYS, COLOR RENDERINGS, AND
INTERIOR DESIGN SERVICES

6.1 GENERAL: Engineering studies and miscellaneous contracts cover a wide range of engineering disciplines. General requirements for these contracts are usually the same as for Design. Various NAVFAC design manuals, military handbooks, EPA regulations, publications and instructions provide guidance. The specific publications, the scope of work, schedule of submittals and other pertinent data not identified in this section, will be contained in the "SCOPE."

6.1.1 Safeguarding Safety and Health. During any field or site visit, the A-E must comply with FAR 52.236-13, "Accident Prevention," and Alternate I, OSHA requirements, and the U.S. Army Corps of Engineers Safety and Health Requirements, EM-385-1-1, take appropriate steps to safeguard the safety and health of his staff and consultants, and the public and Government personnel; and maintain a safe work environment, e.g. property, materials, supplies, and equipment and, as necessary, provide safety barricades, signs, and signal lights. Especially when known hazardous substances exist or are suspected to exist, e.g., PCB, asbestos, lead paint, etc., or entry into confined spaces, under piers/wharfs or elevated areas 6 feet or more above the ground, appropriate protective gear and equipment and proper training shall be provided before any field investigation is attempted. Submit the accident prevention plan prior to commencing work on Government property. In case of special or unusual conditions that may arise, the Commanding Officer may order additional measures be taken as necessary. If an unsafe condition is found, the Contracting Officer may suspend or delay all or part of the work until satisfactory corrective action has been taken. During demolition, renovation, and rehab of old buildings, workers should be advised to take precautionary measures when cleaning up animal excrements such as bat and bird droppings, which may be potential for pathogens.

6.1.2 Engineering Studies Report Format. Submit in the following format, i.e.:

- a. Hard cover with title also included on bound side
- b. Tabs
- c. Executive Summary or Foreword
- d. Table of Contents
- e. Introduction/Background
- f. Findings/Analysis
- g. Conclusions/Recommendations
- h. References
- i. Bibliography

6.2 SOIL MECHANICS AND SITE SEISMICITY: Provide comprehensive research, investigation, and data collection on all surface and subsurface foundation conditions relative to the project site, and the evaluation of such data for the formulation of recommendations requisite for design. Provide investigation phases, if necessary, to support design progress. In addition, the soil investigation should provide reasonable and sufficient

basis for earthwork (site grading and/or utility trenching) performance and cost estimates when earthwork is anticipated to be a major cost item. The information provided should clearly define, for the contract purpose as minimum, the character of the materials to be encountered in the earthwork performance. This information may be provided later in the design stage in a supplementary investigation when the site grading requirement and/or utility alignments are better known. The general requirements for soils mechanics and foundation engineering are described in NAVFAC Design Manuals DM-5, DM-7, and DM-21 series or the latest Military Handbooks pertaining to this subject.

6.2.1 Subsurface Investigation: Prior to commencing subsurface investigations in the field, the A-E shall locate previous soil reports, boring logs, pile driving records, existing utilities, underground structures in Plan Files and/or in the PWC where project is located. The PDE will indicate the location/project which may contain useful information. However, it shall be the A-E's responsibility to locate and review all pertinent reports and information.

a. Historical and Archaeological Resources. In the event borings are required in an area where surface elements of historic properties may be affected, review of the project and archaeological monitoring by PACNAVFACENGCOM archaeologists will be required.

b. Take borings and samples with appropriate care, perform required laboratory testing, visually inspect the site, perform engineering analyses, and prepare a written report of the findings and recommendations. Perform soil borings within the footprints of structures whenever possible. The number of borings and their depth shall be sufficient to obtain data for selection of foundation systems and design criteria and the character of materials to be encountered in the construction. Consider such factors as: area geology; historical data relating to site development and seismic events; any unusual precipitation characteristics; surface and subsurface soil and bedrock conditions; groundwater conditions; seepage conditions; hydraulic transmissibility, erosion control; surface drainage; local or area subsidence; slope stability; creep and other such site characteristics. Be alert for any evidence of possible oil and/or chemical contamination on the site and, as a minimum, conduct field evaluation of each boring sample with equipment capable of detecting petroleum product contamination. If conditions are discovered which require negotiation, notify the PDE verbally and recommend in writing such additional sampling, tests or studies as required to ensure the adequacy of the site and foundation data. After completion of borings, backfill holes and restore ground surface including pavements to the original condition immediately, unless monitoring of water levels is required. Grout and seal boreholes (a) to prevent vertical transmission of water from different aquifers if found, (b) to seal off surface or near surface contaminants from entering into ground, (c) when excavation below groundwater level is anticipated for the project, or (d) when work is done on or around a dam or levee. The grouting and sealing work, including the grout mix, shall be in accordance with the EPA requirements.

For subsurface excavation and pumping out of water from flooded utility structures to verify utilities, the activity Public Works Department or Public Works Center may be able to provide assistance. When this assistance is unavailable and the service is required, then a reimbursable item will be negotiated for this effort with the A-E.

c. Joint Trunking System (JTS): For projects at Ford Island and Manana Family Housing Area coordinate with the Department of Army, Directorate of Information Management (DOIM) at (808) 438-3514 regarding their JTS cables.

6.2.2 Boring Records: Maintain a complete record of each hole. Include the ground elevation referred to an established datum, a description of the character of the materials encountered (include classification by visual or laboratory examination and an indication of the firmness in place), elevations where encountered, elevations where loss of drilling fluid or cave-ins occurred, the elevation of the ground water level first encountered, the elevation of the ground water level after it has stabilized and time of such observations, and any unusual ground water conditions. The accuracy of elevation shall meet the design requirements. Coordinate soil and/or rock classifications keeping in mind the definitions of words that are commonly used in Navy specifications. If rock, including that in various degrees of weathering, is encountered, its engineering character pertinent to the project use shall be provided. Include the date on which borings were made, project identification, complete driving records for the casing and sampler indicating the number of blows per foot or fraction of a foot penetration, the weight and height of fall of the hammer used for driving the casing, the weight and height and fall of the hammer and hammer type (in-hole hammer or out-hole), if used, for driving the sample, the size of casing used, and the size and description (manufacturer and model) of sampler for both undisturbed and disturbed samples. Prepare boring logs in accordance with the sample contained in Appendix Q.

6.2.3 Report: Prepare a comprehensive technical report with the results of the work. Include a map showing the location of each boring as referred to the lines of the proposed structures, to coordinates, to existing structures, or to other features which are readily identifiable on Activity maps, a record of each hole in graphical form and test data of samples, tabulated and clearly presented. Identify the soils classification system and testing procedures used. Include the amount of consolidation (settlement) anticipated. Include graphs, formulas, references, pertinent computations, and other information as required, for a complete understanding of the analysis. Present a complete and comprehensive analysis. Make an interpretation of information from field and laboratory and (provide discussions, as appropriate, on potential for soil heaving, subsidence and other deformation characteristics, and slope stabilities and related concerns, and recommendations.) Give definite recommendations as to the type of suitable foundations and necessary design parameters, critical items for construction, together with estimated deformations (settlements) pertinent to the recommended foundation system.

6.2.4 Soil Testing and Earthwork Standards: Conduct soil testing in accordance with standard ASTM methods or other approved procedures and as a minimum, include the number of data points recommended by these standards. Present test results in a manner recommended by the standard and clearly indicate the standard procedure used by the testing laboratory. Compaction requirements shall be based on ASTM D1557 - Method B, C, or D, except when such test procedure is not appropriate for the material to be used or tested. In such a case, another suitable testing procedure shall be provided, with a copy of testing procedure included in the soil report.

6.2.5 Foundation Design Recommendations: Make recommendations after a thorough evaluation has been made of alternate foundation types to ensure the selection of the most practical and economical foundation system for the proposed structure. The recommendations shall be approved by a registered Civil Engineer with Geotechnical Engineering experience, and also have the concurrence of the A-E civil/structural designers for the project.

6.2.6 Ground Motion Criteria: Certain types of structures, including all essential structures, such as hospitals may require the development of specific seismic ground motion for the site. The following procedures are intended to promote a more uniform approach for establishing ground motion criteria and not intended to limit the methodology considered appropriate by the A-E in the design of earthquake-resistance structures.

6.2.6.1 Procedures: Follow the procedures in Chapter 3 of P-355.1, unless directed or agreed to otherwise in writing by the PDE.

a. In general, consider the dynamic characteristics of the structure to determine the distribution of lateral forces in irregular structures with highly unsymmetrical plans, large differences of stiffnesses of adjacent stories or other unusual structural features. See NAVFAC P-355, P-355.1 and P-355.2 for more details.

b. For the above cases a dynamic analysis is required. Ground motion for the site will be determined by the A-E. A coordinated effort by the structural engineer and the geotechnical consultant is necessary to achieve the design objectives.

6.2.7 Geochemical Evaluation: Certain sites which have a history of industrial use and potential for chemical contamination may be selected for indepth evaluation of geochemical conditions. Such evaluations will generally require adherence to special precautions with regard to personnel safety and sampling handling. Government approval of an A-E prepared health and safety plan and sampling program will be required prior to initiation of the field effort. Conduct geochemical sampling and testing in accordance with standard EPA methods or other approved procedures.

6.2.8 Geotechnical Investigation: Required for all projects which result in disturbance of or imposition of loads upon the surface of the earth. General guidance regarding the extent of field effort and laboratory tests required for various types of projects is contained in DM-7.01. Accomplish

geotechnical work under the supervision of a professional geotechnical engineer who has experience in "responsible charge." A professional geotechnical engineer with "responsible charge" is defined as a registered professional civil engineer (or registered professional geotechnical engineer with the State of California or other states that register geotechnical engineers specifically) with at least 8 years of experience in geotechnical engineering, of which at least 3 years shall be in "responsible charge." The geotechnical portions of the project drawings and specifications shall be reviewed by the geotechnical engineer to ensure geotechnical issues are adequately addressed. Provide the preliminary soil investigation report at the initial stage of design; and furnish the final soil investigation report, including logs of exploration locations, and additional soil borings, test pits, testing and investigation, with the 100 percent submittal. The number of borings and/or test pits and their depth shall be sufficient to obtain data for selection of foundation systems and design criteria and to provide a sound basis for construction cost estimates. A Professional Geotechnical Engineer shall certify the adequacy of the soil and foundation aspects of the design.

6.2.8.1 Inspection: For structures, the geotechnical engineer should make a minimum of one field inspection during construction of the foundation.

6.2.9 Review and Final Submittal: When required as part of a design project, review and submittal shall be as described elsewhere in this Guide. When awarded as a separate contract, review and submittal:

6.2.9.1 Review: Submit six copies of the draft of the final soils report for review. Incorporate the review comments into the final submittal. Resolve any questions or comments with the PDE before making the final submittal.

6.2.9.2 Final Submittal:

- a. Fifteen copies of the report.
- b. Originals of the report.
- c. Material prepared or resulting from the contract such as field books, logs, maps, worksheets and field notes.
- d. Borrowed material.

6.3 SURVEYS: The Government will furnish information regarding the existing horizontal and vertical (horizontal control monuments and benchmarks) of the Activity. Tie into these control systems the location and elevations of all major project structures, pavements, and other features. Where the project location is remote from the activity control monuments, utilize assumed local base lines or benchmarks when approved by the PDE. The plans and specifications shall require the construction Contractor to provide permanent standard NAVY monuments in these areas and supplemental monuments in other areas. For surveying and mapping, the

"SCOPE" will state if computer graphics data base compatible with PACNAVFACENGCOM system is required in addition to prints.

6.3.1. Field Surveys: Generally consists of topograph site surveys, alignment surveys, profiles and cross-sections. Site surveys shall be in sufficient detail to permit the establishment of finish grades and to show all existing structures, pavements, utility lines, obstructions, etc., within the limits of work. Obtain information concerning: drainage areas; connections to existing roads; size of existing utilities; and data required to connect new utilities to the nearest source of adequate supply.

6.3.2 Topographic Surveys: Services for siting, grading and development of a particular project site and the establishment of property lines. Also includes surveys to establish metes and bounds for legal descriptions for real estate holdings and for acquisition of new easements and real estate. Set sufficient number of semi-permanent survey points to serve as initial horizontal and vertical survey control for the construction of the project. Show and describe the horizontal control points and benchmarks on the plans. Also show datum of elevations on the plans.

6.3.3 Maps and Survey Data: Maps or other survey data furnished by the Government are for assistance only. The A-E shall field check and verify the data to ensure that all survey information used in the preparation of plans and specifications is accurate and complete.

6.4 FIELD INVESTIGATIONS: Service required to obtain the necessary field data incidental to the proper accomplishment to the work required under the contract. Investigate and evaluate the adequacy and characteristics of all existing systems including utility systems (water, gas, electrical, storm and sanitary sewer system, steam, fire alarm, etc.) with respect to the additional loads to be imposed by the project and interfacing of the new requirements with the existing systems. Verify all pertinent information of record relative to existing conditions at the site of construction by and on-site investigation. Ensure that new work will fit into existing space without obstruction. After the design has progressed to a point where the alignment and size of work in existing spaces is known, make an on-site investigation to reconfirm that the design is consistent with field conditions. After the alignment and depth of new subsurface work (building foundations, utility lines, etc) has been determined, make an on-site investigation of the alignments utilizing underground detectors for the purpose of identifying existing underground obstructions or unusual conditions which should be identified in the plans and specifications. As part of the field investigation consult with engineering personnel at the Activity Public Works Office or Staff Civil Engineer to review Activity records in order to obtain the necessary information. Submit a letter report to the PDE at the completion of each field investigation trip.

6.5 COLOR RENDERINGS: Color renderings shall have the matted overall dimensions of 27 x 40 inches for major facilities and/or multiple building projects and 20 x 30 inches for typical single building projects. Mount renderings under glare reducing acrylic plastic in a sturdy one inch minimum flat top black metal or wood frame with dimensions of 28 x 41

inches for major facilities and/or multiple buildings projects and 21 x 31 inches for typical single building projects. Provide two renderings for Navy and Marine and three for Air Force projects. Also provide two 8 x 10 inch black and white photographs; one 4 x 5 inch color negative; one 16 x 20 inch Ektachrome print; and one 2 x 2 inch color slide of the rendering. Submit a perspective sketch of the proposed rendering to the PDE for approval before the final rendering is started. Renderings shall depict the facility in the most advantageous view for clarity (normally a three-quarter bird's-eye view).

6.6 INTERIOR DESIGN SERVICES FOR FURNITURE AND FURNISHINGS PROCUREMENT: NAVFAC Interior Design Program objectives, criteria and philosophy are set forth in DM-14.1 "Interior Design" and NAVFAC Instruction 1101.120 "Interior Design". Prior to the initiation of any work, consult/coordinate with PACNAVFACENGCOM DPM401 and DPM031 on schedules and procurement requirements. Confirm if the Activity has an adequate collateral equipment list.

6.6.1 Scope of Work: Interior design services consist of:

a. Color selection and coordination of interior finishes, materials and furnishings.

b. Renderings and other presentation material as required to obtain approval of items and colors.

c. Design or consultation on design of built-in furniture.

d. Approval action of shop drawings or samples submitted by suppliers.

e. Supervision of installation and placement of furniture and furnishings within the completed facility.

f. Preparation of furniture placement plans. Show rooms and/or areas on 24 x 36 inch sheet. Scale shall not be less than 1/8 inch = 1 foot. Submit a reproducible with the completed final interior design package. Use of computer graphics is encouraged.

g. Furniture and Furnishings Procurement List: List shall include a cover sheet, a cost summary sheet, suppliers summary sheet, and furniture specification list. Include stock numbers, descriptions, quantities prices, colors, finishes and fabrics for each item. For items not available from GSA catalogs or other mandatory sources, provide purchase specifications, estimates and other supporting data. Ensure items selected will be available to meet beneficial occupancy dates.

h. Updates: Update and/or make appropriate substitutions at time of purchase. Advisory services as required due to alterations in requirements.

i. Special Presentations: As required by the contract.

6.6.2 Mandatory Procurement Sources: The provisions of both the Federal Property Management regulations, dealing with procurement from Multiple Award Federal Supply Schedule Contracts, and NAVSUP Manual Vol. II, Ch. 2, dealing with Sole Source Procurement, require that the preparer of the collateral equipment final buy packages in conjunction with the end user fully justify the procurement of other than the lowest delivered price item which will satisfy the end use requirement. Justification of purchases for other than the lowest delivered price must be based on special or definitive needs which are clearly associated with the achievement of program objectives. Complete justification for the requirement of higher cost equipment or any proprietary item must accompany the collateral equipment submittal.

Although the collateral equipment buy packages should be prepared in accordance with these provisions, it is also important to assess the quality of the equipment selected. This is to ensure that what is procured will satisfy the facility requirements in terms of not only low cost but in durability and flexibility. It is therefore important to describe the salient characteristics of the desired equipment in order for the Contracting Officer to understand the selections made. It will also expedite the manner of competition required when comparing like items in terms of quality and function.